

Shawn Sartorius
“WOLVERINE”, U.S. Fish and Wildlife Service
585 Shepard Way, Suite 1
Helena, Montana 59601
30 April 2013

Dear Shawn:

I have completed my review of the proposed rules regarding the *Notice of the Proposed Listing of a Distinct Population Segment of the North American Wolverine Occurring in the Contiguous United States* and the *Establishment of a Nonessential Experimental Population of the North American Wolverine in Colorado, Wyoming, and New Mexico*. I made comments directly on the Word document for each rule and have included 26 attachments (Attachments A–Z) that supplement my comments on the Proposed Listing Rule. These documents are in a folder titled “Attachments.” There is also a folder titled “Additional References” that contains 15 new references cited in Attachment A.

Attachment A is a 30-page document that details reasons why I concluded that the determination to list the wolverine is not based on the best available science, so you may want to look at Attachment A first. A summary of this finding is on page 29 of Attachment A but I include it here so that you know beforehand what will be in this Attachment:

Errors in defining wolverine habitat have significant repercussions for projections of future wolverine habitat in the western United States under climate warming. The proposed listing determination relies heavily on a few research studies as the "best available science" relative to wolverine habitat in the western states. As a consequence, I have focused my review in Attachment A on these particular studies: Aubry et al. (2007), Schwartz et al. (2009), Copeland et al. (2010), and McKelvey et al. (2011), particularly the latter two. In each of these studies, the assumption of obligate snow cover extending to 15 May [14 May in Aubry et al. 2007] was a critical component of the authors' conclusions regarding denning and year-round habitat for wolverines. Copeland et al. (2010) assumed that a suitable surrogate for where wolverine habitat occurs on a global scale is obligate snow cover on 15 May as determined by MODIS snow cover data. Even though the authors cautioned that the spring snow cover was an approximation of underlying bioclimatic requirements and that slight shifts in the analysis period could result in significant changes in areal snow cover, the 15 May MODIS snow cover was used to project future wolverine habitat under climate warming in McKelvey et al. (2011). However, the best available science does not support the assumption that the 15 May MODIS snow cover defines wolverine habitat for reasons detailed in Attachment A. Consequently, conclusions regarding the effect of climate warming on future wolverine habitat in McKelvey et al. (2011) are invalid. The best available science indicates that snow cover as a requisite for wolverine denning in the western states is not obligatory after 30 April, possibly even earlier in April. Following the same approach as McKelvey et al. (2011, p. 2885–2886) to project future wolverine habitat in 2070–2099 (~2085) based on 29 May MODIS data and using a 30 April date for obligatory snow cover rather than a 15 May date, one must conclude that spring snow cover in ~2085 on 30 April will be similar to present-day 15 May snow coverage. Therefore, the projected loss of critical habitat for wolverines in the foreseeable future (i.e., over the 21st century) in the western United States is not supported by the science presented in the proposed listing determination.

In addition, in my review I found 1) some inaccuracies in description and analysis of the biology, habitat, and historic distribution of the wolverine, as well as 2) some inaccuracies and inadequacies in the review and analysis of factors affecting the wolverine. I do not believe the conclusions reached are supported by the evidence that was provided and I found that, although literature was cited to support the assumptions, arguments, and conclusions, the literature was at times incorrectly cited and at times did not support the arguments being put forward. The specific places where this occurred are pointed out in the individual comments on the Word documents you provided.

I also found there was a lack of specificity for certain terms used in the document that led to uncertainty on my part on how to interpret what was being stated. I suggest specific definitions for terms that are used repeatedly throughout the documents such as deep persistent spring snow cover. I have pointed out where these terms occur in my review of the listing rule. These terms should be defined at the beginning of the document and used with quotes wherever you are referring to them in the document. Without specific definitions of terms, one does not know how to gauge the accuracy of the statement or how to test the stated fact either now or in the future. For example “spring snow cover” can be used either as a general reference to snow cover anytime in the spring or it could refer specifically to the “spring snow coverage” as defined by Copeland et al. 2010 or McKelvey et al. 2011.

Finally, my overall impression after a careful review of the proposed listing determination is that the document was intended as a justification for listing the wolverine rather than an unbiased scientific review of why the wolverine should be listed, and there is a difference. A review of the scientific basis for listing should be unbiased and thorough, and I feel that the proposed listing is weak on these two points. Biases in scientific reviews are often unintentional, even among scientists trained to avoid bias, so my intent is not to point fingers here but to suggest that any revision of the proposed listing determination should take special precautions to avoid bias in the scientific review process. A peer review of the scientific facts used to justify the listing should comprise *primarily* reviewers outside the community of researchers invested in wolverine research in the DPS (and that would include me) in order to avoid bias.

I thank you for the opportunity to review the listing proposal and 10j rule and will be happy to answer any questions regarding my review. I will be traveling over the next few weeks and may not have access to email so feel free to call if you have questions. I believe you have my cell phone number and my email is listed below. Please note that I am no longer with The Wolverine Foundation, Inc. so any mailings should be sent to me at the address below. Also, as requested, I have attached my current curriculum vitae.

Best regards,

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